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DETONATING CORD INVENTORY CONTROL MARKING SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This utility application incorporates by reference and claims priority to a prior provisional application filed in the USPTO on March 28, 2003, assigned Serial No. 60/458,466.

TECHNICAL FIELD

[0002] This invention relates to a method of marking detonating cord to provide a precise and facile means of controlling inventory at field locations.

BACKGROUND OF THE INVENTION

[0003] Detonating cord is widely used in various blasting operations in mining, quarrying, and oil well servicing. Detonating cord typically consists of a high explosive core that is encased in textiles and then covered in an outer plast6ic jacket. The explosive core can consist of PETN, RDX, HMX, HNS or other secondary high explosives. Typical textiles are cotton, polyester, polypropylene, or Kevlar. Plastic jacket materials are thermoplastic materials chosen for their handling characteristics or high temperature resistance. Typical thermoplastics are PE, PVC, Nylons, and fluoropolymers.

[0004] Regardless of the materials chosen, detonating cord is typically supplied on a reel inside an outer fiberboard box. Typical reel sizes range from 500

feet to 2,000 feet depending on the ultimate customer application. These sizes are light enough to be easily handled and yet large enough to be economically shipped. A customer will receive the detonating cord package and place the package inside a storage magazine until its use is required.

[0005] In field use the reel of detonating cord will be removed from the box and detonating cord can be unreeled horn the spool until the desired length is removed from the spool. Then the spool is returned to the box and returned to the storage magazine. For inventory control purposes, the new length of product remaining on the spool must be marked on the spool and recorded in the explosive inventory log.

[0006] Having an accurate inventory of explosive products is of critical importance. The Bureau of Alcohol Tobacco and Firearms (BATF) as well as State and local agencies regulate explosive storage in the United States. All of these government agencies require that an accurate inventory of explosive items be kept. In the case of detonating cord supplied in bulk on a reel, it is extremely difficult to maintain an accurate inventory as material is removed from the reel. Unless each removal is accurately recorded, inventory discrepancies may arise. Also marking each removal on the spool flange leads inevitably to crossed out numbers and the possibility of significant errors. Due to the explosive nature of the product, maintenance of an accurate inventory is absolutely essential.

[0007] It is therefore an object of this invention to provide a detonating cord with a marking system to facilitate close inventory control.

[0008] It is a further object of this invention to provide a detonating cord clearly marked for cutting precise lengths in the field.

[0009] Other objects will be in part obvious and in part pointed out in more detail hereinafter.

[0010] A better understanding of the objects, advantages, features, properties and relations of the invention will be obtained from the following description and

accompanying drawings which set forth certain illustrative embodiments and are indicative of the various ways in which the principles of the invention are employed.

SUMMARY OF THE INVENTION

[0011] A detonating cord product according to the present invention comprises, in its preferred embodiment, a detonating cord with markings along its entire length to provide information allowing precise lengths to be cut in the field and provide accurate information on the length of detonating Cord remaining on the reel. For automated inventory control, some of the markings can be in the form of bar codes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Fig. 1 shows a 500-foot length of detonating cord that would be wound on a reel for field use. Marks are placed on the detonating cord at intervals of 20 feet with the remaining footage printed next to the mark. As detonating c0ord is removed from the reel, the footage markings provide a clear record of the amount of material remaining on the reel.

[0013] Fig. 2 shows a conventional reel of unmarked cord.

DETAILED DESCRIPTION OF CERTAIN PREFERRED EMBODIMENTS

[0014] In the oil well servicing industry, detonating cord is typically provided on 500-foot reels. This detonating cord is used to initiate well perforating charges in a perforating gun. A typical perforating gun assembly may hold 20 to 40 individual shaped charges. These charges consist of a metal housing containing a pressed explosive charge. A powdered metal liner is then pressed into the explosive charge. When initiated, the shaped charge forms a high velocity jet that will perforate the well casing and the surrounding rock formation allowing oil to flow into the well.

[0015] Detonating cord is threaded along the back of the shaped charges to transmit an initiation signal to detonate the individual shaped charges. For a typical perforating gun, the overall length of the gun is twenty feet.

[0016] In loading a perforating gun, the reel of detonating cord will be positioned on a payoff stand. Next to the first mark on the detonating cord is the number "500". This number indicates that there is a full reel of 500 feet of detonating cord on the reel. Detonating cord is removed from the reel until the next mark is reached. The number "480" is positioned next to the second mark, indicating the 480 feet of detonating cord remains on the reel. The detonating c6rd is cut at the second mark and the twenty-foot length of detonating cord removed is used to load the perforating gun.

[0017] When the reel of detonating cord is returned to the explosive storage magazine, the mark on the reel indicates to the magazine keeper that the quantity of detonating cord being returned to the magazine is 480 fret. The magazine keeper can accurately update his written magazine inventory records accordingly.

[0018] Referring in detail to drawing 1, the detonating Cord length of 500 feet is indicated by the number 10. The detonating cord is marked with bands 12, with the bands being located twenty feet apart. Located next to each bond is a number indicating footage remaining on the reel 14. This number starts at "500" indicating a full reel of 500 feet of detonating cord. The number decreases in increments of 20 feet until all of the detonating cord has been removed from the reel.

[0019] Fig. 2 shows a conventional reel having detonating cord wound on the drum portion, between end flanges axially spaced on the drum. Note the hole to receive an elongated axle or the like to facilitate support of the reel as the user walks (or runs) from the location where he has set the charge to a safe distance where he can detonate that charge.

[0020] If he has a "used" reel that is not full, but may have less than the 500 feet supplied initially, he will have to guess how much may be left for his next 50 foot walk (or run).

[0021] In order to provide a quantitative indication of the length of detonating cord he has left in a "used" reel we have improved the cord to add incremental markings, preferably every foot (or yard/meter) to give the user a safer product than the currently available reels of detonating cord.

[0022] In addition to the inventory control markings, additional markings can be applied to the detonating cord indicating the type of explosive contained in the detonating cord, the product designation, and safety information such as "EXPLOSIVE DANGEROUS". Also some or all of the information can be in the form of a bar code readable by an optical scanning device.

[0023] Although the invention has been illustrated and described with respect to exemplary embodiments thereof, it should be understood by those skilled in the art dud the foregoing and various other changes may be made departing from the spirit and scope of the invention.